UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/756,778	01/10/2001	Arnaud Gueguen	201587US2	6492

22850 7590 04/26/2005

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
TORRES, JOSEPH D	
ART UNIT	**PAPER NUMBER**
2133	

DATE MAILED: 04/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/756,778	GUEGUEN, ARNAUD	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,8-11,13-22,24 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 6, 8-11, 13-22, 24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/28/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-4, 6, 8-11, 13-22, 24 and 25 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

2. The drawings are objected to because lines 9-10 on page 21 of the Applicant's disclosure teach that Step 60 in Figure 6 is a coding procedure not a decoding procedure and line 26 on page 16 of the Applicant's disclosure teach that Step 85 is quality determination step not a "quantity" determination step. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If

the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Claim 1 presents new matter, "performing error-correcting coding of digital data to produce **error-corrected** digital data with error-correcting coding" [Emphasis Added]. The Examiner asserts that nowhere in the specification does the Applicant teach a coding means or method for producing "error-corrected digital data" prior to data transmission. The Examiner asserts that generally an error correction coding means or method produces error-correction encoded digital data and that it takes a decoder or a decoding method to decode the error-correction encoded digital data to produce error-corrected digital data.

Claim Objections

4. Claims 1-4, 6, 8-11, 13-22, 24 and 25 are objected to because of the following informalities: The preamble of claim 1 recites, "A method", but does not indicate to what the invention is directed. The Examiner suggests: --A method for a digital communication system--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-4, 6, 8-11, 13-22, 24 and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 presents new matter, "performing error-correcting coding of digital data to produce **error-corrected** digital data with error-correcting coding" [Emphasis Added]. The Examiner asserts that nowhere in the specification does the Applicant teach a coding means or method for producing "error-corrected digital data" prior to data transmission. The Examiner asserts that generally an error correction coding means or method produces error-correction encoded digital data and that it takes a decoder or a decoding method to decode the error-correction encoded digital data to produce error-corrected digital data.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-4, 6, 8-11, 13-22, 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. Claim 1 presents new matter, "performing error-correcting coding of digital data to produce

error-corrected digital data with error-correcting coding" [Emphasis Added]. The Examiner asserts that nowhere in the specification does the Applicant teach a coding means or method for producing "error-corrected digital data" prior to data transmission. The Examiner asserts that generally an error correction coding means or method produces error-correction encoded digital data and that it takes a decoder or a decoding method to decode the error-correction encoded digital data to produce error-corrected digital data. The omitted elements are: how an encoding device can produce "error-corrected digital data".

7. Claims 1-4, 6, 8-11, 13-22, 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "determining a decoded information quality parameter from the determined decoded characteristic statistical quantity and at least one configuration parameter" is indefinite since it has two different interpretations 1) --determining at least one configuration parameter and a decoded information quality parameter from the determined decoded characteristic statistical quantity -- and --determining a decoded information quality parameter from the determined decoded characteristic statistical quantity and from at least one configuration parameter--. The Examiner assumes the following was intended: --determining a decoded information quality parameter from the determined decoded characteristic statistical quantity and from at least one configuration parameter--.

Claim 11 has two verbs "includes is" following each other, which makes claim 10 indefinite.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-4, 6, 8-11, 13-22, 24 and 25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. An Abstract Algorithm is non-statutory unless it requires some tangible hardware. The Authoritative Dictionary of IEEE Standards terms defines transmit as to move data from one location to another location; hence transmitting does not require hardware. All of the steps in the claims can be carried out by hand. No matter how the Applicant argues, any process for manipulating substantial digital data carried out by hand can hardly be considered useful because most people would not live long enough to reap the benefits of such a process. The examiner suggest replacing "transmitting the error-correction encoded digital data with error-correcting coding" with --transmitting error-correction encoded digital data with error-correction coding over a communication channel--. Note: transmitting error-correction encoded digital data with error-correction coding **over a communication channel** requires at least a modulator, which is hardware.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-4, 6, 8-11, 13-22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hladik; Stephen Michael et al. (US 5734962 A, hereafter referred to as Hladik) in view of Wicker (Stephen B. Wicker, Error Control Systems for Digital Communication and Storage, Prentice-Hall, 1995, pages 116-121).

35 U.S.C. 103(a) rejection of claim 1.

Hladik teaches performing error-correcting coding of digital data to produce error-correction encoded digital data with error-correcting coding (Figure 3 in Hladik teaches a means for performing error-correcting coding of digital data to produce error-correction encoded digital data with error-correcting coding);

transmitting the error-correction encoded digital data with error-correcting coding

(Modulator 84 in Figure 2 in Hladik is a means for transmitting the error-correction encoded digital data with error-correcting coding);

receiving the error-correction encoded digital data with error--correcting coding to provide received error-correction encoded digital data with error-correcting coding (Demodulator 86 and Packet-to-Codeword Converter 88 in Figure 2 in Hladik are a means for receiving the error-correction encoded digital data with error--correcting coding to provide received error-correction encoded digital data with error-correcting coding);

decoding the received error-correction encoded digital data with error-correcting coding using a turbo decoding process to determine a decoded characteristic statistical quantity from a set of weighted output information (col. 6, lines 42 in Hladik teach that each of the N component decoders in Figure 4 use the MAP algorithm of columns 7-8 in Hladik; each of the decoders uses the matrix Γ to weight α and β prior to calculating λ, i.e., each of the λ's from the respective Decoders 1 to N-1 in Figure 4 is weighted output information; Equation 1 in col. 7 teaches λ from Decoder N is a decoded characteristic statistical quantity; hence Decoder N in Figure 4produces a decoded characteristic statistical quantity λ from the set of weighted output information λ's from the respective Decoders 1 to N-1 in Figure 4); and determining a decoded information quality parameter from the determined decoded characteristic statistical quantity and at least one configuration parameter (Figure 4 in Hladik teaches that Threshold Decision Device 112 is used to generate at least one configuration parameter; col.6, lines 10-12 teach that Outer Decoder 114 in Figure 4 is a Reed Solomon Decoder; Note: a Reed-Solomon

decoder produces syndromes which are decoded information quality parameters: hence Hladik teaches determining a decoded information quality syndrome parameters from the determined decoded characteristic statistical quantity λ from Decoder N and from at least one configuration parameter from the Threshold Decision Device 112).

However Hladik does not explicitly teach the specific details of a Reed-Solomon decoder.

Wicker, in an analogous art, teaches the specific details of a Reed-Solomon decoder (the algorithm on pages 117-119 of Wicker is a typical algorithm for decoding Reed-Solomon codes). Note: algorithm on pages 117-119 of Wicker teaches a decoder for determining a decoded information syndrome quality parameter s (Note: on page 117, Wicker teaches s=d'-d'') and Hladik teaches Outer Decoder 114 decodes using the determined decoded characteristic statistical quantity λ from Decoder N and at least one configuration parameter from the Threshold Decision Device 112.

Note: the determined decoded information quality parameters s_i on page 117 of Wicker are numerical scalar or an integer numbers representing a probable number of errors existing in a set of decoded information items, and are used to determine a weighting factor, error pattern e on page 119 (Note: an error pattern is a string of probabilistically weighted values indicating the probability of an error at a particular postion).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hladik with the teachings of Wicker by including the specific details of a Reed-Solomon decoder. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because

one of ordinary skill in the art would have recognized that the specific details of a Reed-Solomon decoder would have provided a means for decoding a Reed-Solomon encoded data stream in the Hladik patent.

35 U.S.C. 103(a) rejection of claim 2.

Hladik teaches that the determined decoded information quality parameter s is used to determine said weighting factor after the decoding step (see Rejection to claim 1).

35 U.S.C. 103(a) rejection of claim 3.

Hladik teaches that the determined decoded information quality parameter is used to determine said weighting factor during a subsequent turbo-decoding process iterations of Decoder 1-N-1 in Figure 4 of Hladik.

35 U.S.C. 103(a) rejection of claim 4.

Hladik teaches that the turbo decoding process includes elementary decoding steps each using part of the received digital data with error-correcting coding corresponding to a redundant information item associated with a corresponding elementary coding step (Demultiplexer 116 in Figure 4 distributes portions of the received digital data with error-correcting coding corresponding to a redundant information item associated with a corresponding elementary coding step to component Decoders 1 to N), for generating an output including an information item comprising an extrinsic information item

transmitted at least to one or more other elementary decoding steps (Decoders 1 to N in Figure 4 of Hladik generate output including an information item comprising an extrinsic information λ item transmitted at least to one or more other elementary decoding steps), the turbo decoding process elementary decoding steps being iterated, transmitting at least one extrinsic information item obtained during one iteration of the turbo decoding process to another iteration of the turbo decoding process (Decoders 1 to N in Figure 4 of Hladik transmit at least one extrinsic information item obtained during one iteration of the turbo decoding process to another iteration of the turbo decoding process), and the determining of the decoded characteristic statistical quantity includes determining the decoded characteristic statistical quantity from a set of extrinsic information items at the output of at least one said elementary decoding step (Decoders 1 to N in Figure 4 of Hladik determine the decoded characteristic statistical quantity λ from Decoder N by determining the decoded characteristic statistical quantity λ from Decoder N from a set of extrinsic information items λ's from Decoders 1 to N-1 at the output of at least one said elementary decoding step Decoders 1 to N-1).

35 U.S.C. 103(a) rejection of claim 6.

Equation 1 of col. 7 in Hladik teach that the decoded characteristic statistical quantity λ of Hladik is calculated from a statistical/probability function. Probabilities are always positive hence equal to its own absolute value and are associated with an expected value. In a discrete probabilistic system with exactly one outcome, probability is substantially equal to the mean value.

35 U.S.C. 103(a) rejection of claim 8.

Decoders 1 to N in Figure 4 of Hladik determine the decoded characteristic statistical quantity λ from Decoder N by determining the decoded characteristic statistical quantity λ from Decoder N from a set of extrinsic information items λ's from Decoders 1 to N-1 at the output of at least one said elementary decoding step Decoders 1 to N-1.

35 U.S.C. 103(a) rejection of claim 9.

Decoders 1 to N in Figure 4 of Hladik determine the decoded characteristic statistical quantity λ from Decoder N by determining the decoded characteristic statistical quantity λ from Decoder N from a set of extrinsic information items λ's from Decoders 1 to N-1 at the output of at least one said elementary decoding step Decoders 1 to N-1.

35 U.S.C. 103(a) rejection of claim 10.

Decoders 1 to N in Figure 4 of Hladik determine the decoded characteristic statistical quantity λ from Decoder N by determining the decoded characteristic statistical quantity λ from Decoder N from a set of extrinsic information items λ's from Decoders 1 to N-1 at the output of at least one said elementary decoding step Decoders 1 to N-1.

35 U.S.C. 103(a) rejection of claim 11.

Decoders 1 to N in Figure 4 of Hladik determine the decoded characteristic statistical quantity λ from Decoder N by determining the decoded characteristic statistical quantity

λ from Decoder N from a set of extrinsic information items λ's from Decoders 1 to N-1 at the output of at least one said elementary decoding step Decoders 1 to N-1. the decoded characteristic statistical quantity λ from Decoder N is statistical quantity representing the probable number of errors which exist in the set of decoded information items.

35 U.S.C. 103(a) rejection of claim 13.

Threshold Decision Device 112 in Hladik generates at least one configuration parameter includes a parameter characterizing decoding conditions (Note: error correction information is a parameter characterizing decoding conditions).

35 U.S.C. 103(a) rejection of claim 14.

Threshold Decision Device 112 in Hladik generates at least one configuration parameter includes a parameter characterizing transmission conditions (Note: error correction information is a parameter characterizing transmission conditions).

35 U.S.C. 103(a) rejection of claims 15 and 16.

Threshold Decision Device 112 in Hladik generates at least one configuration parameter includes a parameter characterizing transmission conditions and is reflective of the signal to noise ratio (Note: error correction information is a parameter characterizing transmission conditions and is reflective of the signal to noise ratio).

35 U.S.C. 103(a) rejection of claim 17.

Col. 6, lines 42 in Hladik teach that each of the N component decoders in Figure 4 use the MAP algorithm of columns 7-8 in Hladik; each of the decoders uses the matrix Γ to weight α and β prior to calculating λ, i.e., each of the λ's from the respective Decoders 1 to N-1 in Figure 4 is weighted output information; Equation 1 in col. 7 teaches λ from Decoder N is a decoded characteristic statistical quantity; hence Decoder N in Figure 4produces a decoded characteristic statistical quantity λ from the set of weighted output information λ's from the respective Decoders 1 to N-1 in Figure 4. the matrix Γ is predetermined reference table.

35 U.S.C. 103(a) rejection of claim 18.

Outer Code Encoder 114 in Figure 4 of Hladik produces a set of decoded information items as a sequence of binary information items containing N symbols.

35 U.S.C. 103(a) rejection of claim 19.

Each of the Decoders 1 to N-1 in Figure 4 of Hladik produces a set of decoded information items as a sequence of binary information items representing a fraction of a decoding sequence.

35 U.S.C. 103(a) rejection of claim 20.

Col. 6, lines 42 in Hladik teach that each of the N component decoders in Figure 4 use the MAP algorithm.

35 U.S.C. 103(a) rejection of claim 21.

See Figures 3 and 4 in Hladik for puncturing and de-puncturing steps.

35 U.S.C. 103(a) rejection of claim 22.

Satellite 12 in Figure 1 and Figure 3 in Hladik indicates a number of output channels are provided to each receive the transmitted digital data.

35 U.S.C. 103(a) rejection of claim 24.

Threshold Decision Device 112 in Hladik generates at least one configuration parameter includes a parameter characterizing transmission conditions and is reflective of the signal to noise ratio (Note: error correction information is a parameter characterizing transmission conditions and is reflective of the signal to noise ratio).

35 U.S.C. 103(a) rejection of claim 25.

Col. 6, lines 42 in Hladik teach that each of the N component decoders in Figure 4 use the MAP algorithm of columns 7-8 in Hladik; each of the decoders uses the matrix Γ to weight α and β prior to calculating λ, i.e., each of the λ's from the respective Decoders 1 to N-1 in Figure 4 is weighted output information; Equation 1 in col. 7 teaches λ from Decoder N is a decoded characteristic statistical quantity; hence Decoder N in Figure 4produces a decoded characteristic statistical quantity λ from the set of weighted output

information λ's from the respective Decoders 1 to N-1 in Figure 4. the matrix Γ is predetermined reference table.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JOSEPH TORRES
PRIMARY EXAMINER

Joseph D. Torres, PhD
Primary Examiner
Art Unit 2133